

NOMENCLATURAL STUDIES IN *DIANELLA* LAM. EX JUSS. (PHORMIACEAE) 1.

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Summary

Anthericum adenanthera G. Forster is lectotypified and *Dianella intermedia* Endl. is neotypified. *Dianella adenanthera* comb. nov. is made for certain plants in New Caledonia. The species does not occur in Australia. *D. adenanthera* and *D. intermedia*, from Norfolk Island, are not conspecific.

While preparing an account of *Dianella* for Flora of Australia (Henderson 1987) and undertaking cytological studies in the genus since 1971, I have been aware that *Anthericum Adenanthera* G. Forster (1786) is a name pertinent to nomenclature in *Dianella* that has not been satisfactorily placed by various botanists dealing with *Dianella* in the Pacific Basin. In 1977, I concluded (Henderson 1977) that, based on specimens at K, Forster's name applies to plants of at least three taxa he and his father, J.R. Forster, collected in New Caledonia in 1774 when accompanying Captain James Cook in the Resolution on his second voyage in the Pacific Ocean. The supposition that Forster's name applies to more than one taxon is supported by specimens at BM, GOET and UPS, and the taxonomic treatment of their plants by B. Seemann (1868) and J. Schlittler (1940). C. Skottsberg (1937) also considered their material a mixture of taxa.

Three relevant sheets are available at K. For purposes of discussion they are here arbitrarily designated sheets x, y and z respectively. Sheet x, labelled "Anthericum Adenanthera", has a mixture of material of two taxa mounted on it. Again for purposes of discussion, these shall be referred to as Taxon 1 (shoot with old inflorescence axis; left side) and Taxon 2 (shoot base only; middle of sheet). This sheet also has two detached old inflorescence axes, intertangled with each other and the leaves of the shoots, mounted between the two shoots. Neither can be placed unequivocally with the shoot on the right.

Sheet y, labelled "Anthericum Adenanthera var. (Forster)", bears a specimen of a third taxon here arbitrarily called Taxon 3, while sheet z, labelled "Anthericum Adenanthera var. 2 (Forster)", bears another specimen of Taxon 1 which consists of a leafy shoot and a detached old inflorescence with parts of one or two flowers/buds remaining. The labelling on these three sheets suggests that even the Forsters themselves considered they had collected three taxa.

There are two sheets of material labelled "Anthericum Adenanthera" in the Forster herbarium at GOET.

The first (arbitrarily sheet a) is labelled

"1. 105.a. Anthericum Adenanthera Prod. 149"
and

"Anthericum Adenanthera Forst. Prod. 24. 149
= Dianella
In Nova Caledonia
leg. Forster
Dr. J. Forster"

This has a specimen of Taxon 3 mounted on it.

The second sheet (arbitrarily sheet b) is labelled

"105.b. Anthericum Adenanthera Prod. 149.
Varietas"

and carries another tag stating "Original Forster".

This sheet bears a specimen of Taxon 1. Unfortunately, this specimen is sterile, lacking even the axis of an old inflorescence as well as floral and fruiting parts.

In trying to place *Anthericum adenanthera* G. Forster and establish its relevance to Australian plants over the years, I have found Forster specimens of it in a number of other European herbaria. For instance, in Vahl's herbarium at C (photo BRI), there is a sheet labelled

“HB Vahlian — *Dracaena ensifolia*
Anthericum adenanthera Forst.
 nova Caledonia misit Dr Montin”

with material that is almost certainly a duplicate from the Forsters' collection. This is a specimen of Forster's Taxon 1.

In Thunberg's herbarium at UPS there is a sheet labelled by Thunberg as

“*Anthericum adenanthera*
 e Nova Caledonia Prof. Forster” (photo BRI).

This contains material of Forster's Taxon 3 and probably material of his Taxon 2 (shoot base missing).

When at P in 1979, I was shown a specimen of *Anthericum adenanthera* by Dr H. Heine which, he informed me, had originally been mounted, labelled and sent to P by George Forster. Though it has subsequently been remounted, his original handwritten label has been retained and mounted with it. Dr Heine considered this probably the most authentic indication of what George Forster intended his name to apply to. There is no guarantee that any other relevant material I have seen, including that at GOET, the supposed repository of Forster holotypes, had been labelled by Forster or his father, Johann Reinhold. Logically then, the Paris specimen should be selected as lectotype of *Anthericum adenanthera*. It is wholly of one taxon (Taxon 3) and can be placed unequivocally, i.e. it applies to the taxon currently known as *Dianella javanica* (Blume) Kunth, e.g. Jessop (1979), or *Rhuacophila javanica* Blume as I now consider it should be called.

This is consistent with the material in GOET, i.e. Taxon 3 on sheet a represents the type variety of *Anthericum adenanthera* and Taxon 1 on sheet b, a separate variety.

When Forster's protologue to *Anthericum adenanthera* is considered, however, brief though it is, the descriptive word “connatis” in relation to the leaves cannot apply to *Rhuacophila javanica* whereas it certainly does apply to Taxon 1 and Taxon 2, both definitely species of *Dianella*. Entry for species 149 on page 24 of Forster's Prodrusus reads

“A. Adenanthera, foliis lineari-ensiformibus basi connatis; glandula inter filamentum et antheram. F.
 Noua Caledonia.”

In *Rhuacophila javanica* the leaf is not connate in any part, neither at the base of the blade nor at the base of the sheath, conditions that are present in Taxa 1 and 2. According to the Guide for Determination of Types in the current International Code of Botanical Nomenclature (ICBN) (Voss 1983-T.4.d.) the clearly indicated intention of the author should not be followed if the lectotype so selected is in conflict with the protologue. This would be especially so where there is original material that is not contrary to the protologue.

The Paris sheet, authentic though it is, should not therefore be considered for lectotypification of *Anthericum adenanthera*. If not, the lectotype must then be selected from either Taxon 1 or Taxon 2 for I am not aware that Forster's name applies to any other taxa.

By T.4.e. of ICBN, lectotypes selected from heterogeneous type material should be chosen to preserve current usage especially if another author has already segregated one of the elements as another taxon. In fact material of Forster's Taxon 3 at BM was included as a syntype of *Dianella austro-caledonica* by Seemann (1868) without him realizing it was conspecific with Blume's *Rhuacophila javanica*. Selecting material of Taxon 1 or 2 would then be broadly in agreement with Seemann's treatment of the remaining Forster type material at BM, which he identified as *Dianella intermedia* Endl. It is unclear why he did not take up the epithet *adenanthera* for this considering he

included *Anthericum adenanthera* in synonymy, ignoring or perhaps overlooking its earlier publication.

There is, fortunately, another authentic guide to selecting a lectotype for Forster's name. In the years following the Forsters' return from their voyage on the Resolution with Captain Cook, they fell, for various reasons explained by Hoare (1976), upon hard times and in August of 1776, to stay solvent, J.R. Forster accepted Joseph Banks' offer of 400 guineas for a series of George Forster's drawings from the voyage. Amongst those, which are now held in the Botany Library of the British Museum (Natural History), is a pencilled sketch of *Anthericum adenanthera* labelled as from "N Caledonia 9 September 1774" (photo BRI). Though only a rough sketch, there is no doubt that this is a representation of a plant of Taxon 1.

In the light of this drawing, Forster's protologue and the specimens in BM, C, GOET and UPS mentioned above, it seems a specimen of Taxon 1 should be selected as lectotype of Forster's name. Amongst the material I have seen, sheet z above at K (labelled "*Anthericum adenanthera* var. 2 (Forster)"), though lacking complete flowers or fruits, is the best specimen available and so I hereby select it lectotype of *Anthericum adenanthera* G. Forster. See Fig. 1.

Having lectotypified the name, it now remains to establish the correct identity of the plant it refers to, which is definitely a species of *Dianella*.

I visited New Caledonia briefly in 1978 while in transit to K and, with the friendly co-operation of Drs H.S. McKee, P. Morat (now Director of P) and J.M. Veillon at NOU, was able to investigate and collect specimens of *Dianella* near Noumea (near the sea and in the foothills of Mt Koghi) and to the east of that city on the road to Yate and on the Plaine des Lacs. I was able to see, along with others, living plants of Forster's Taxa 1 and 3, and collect specimens of Taxon 1 at Baie Tina, Noumea (Henderson H2627, BRI). Some time later I received for BRI a collection from Lifou in the Loyalty Islands (J.M. Veillon 4143) which I take to represent Forster's Taxon 2.

The *Dianella* taxa of New Caledonia were dealt with critically by J. Schlittler in his monograph of the genus (Schlittler 1940) where he related them to others throughout the genus' range. Years later he again reviewed the New Caledonian taxa (Schlittler 1954) in an account covering specimens collected in that area by M.G. Baumann and H. Hurlimann in 1950-1952 during a joint Franco-Swiss mission there.

In his 1940 account, Schlittler treated *Anthericum adenanthera* (1786) and *Dianella ensifolia* (L.) DC., based on *Dracaena ensifolia* L. (1767), as synonyms of *Dianella nemorosa* Lam. (1792), *nom. illeg.* This latter name, incidentally, strictly applies only to *D. ensata* (Thunb.) R. Henderson, based on *Dracaena ensata* Thunb., from the western Indian Ocean (fide Henderson 1977). To Schlittler, however, *D. nemorosa* was a very diverse taxon widely spread throughout the tropics in the Indian Ocean and Pacific Ocean basins but not extending to New Caledonia. As far as the Forsters' type material is concerned, he, inexplicably, cited some under *Dianella javanica* (p 241) and some under *Dianella intermedia* (p 247) without specifying what material was type of *A. adenanthera* or citing any under *D. nemorosa*. Both these *Dianella* names were published later than *A. adenanthera*. As can be seen by the specimen at C above, *Dracaena ensifolia* and *Anthericum adenanthera* had been equated by botanists before Schlittler.

I have considered typification of *Dianella nemorosa* and *Dianella ensifolia* previously (Henderson 1977, 1987) and now consider that the lectotypes of these names are not conspecific with the lectotype chosen above for *Anthericum adenanthera*. From the admittedly small amount of *Dianella* material seen from New Caledonia, I have no reason to disagree with Schlittler's view that neither *Dianella nemorosa* nor *D. ensifolia* occurs in that country. This being so, and *Anthericum adenanthera* being the oldest legitimate name applying to a species of *Dianella* in New Caledonia, a new combination under *Dianella* is required for this species and is made as follows.

***Dianella adenanthera* (G. Forster) R. Henderson, comb. nov.**

Anthericum Adenanthera G. Forster, Fl. ins. austr. 24 (no. 149) (1786).

Type: Noua Caledonia, September 1774, J.R. & G. Forster (lecto: K; isolecto: C, GOET, K).

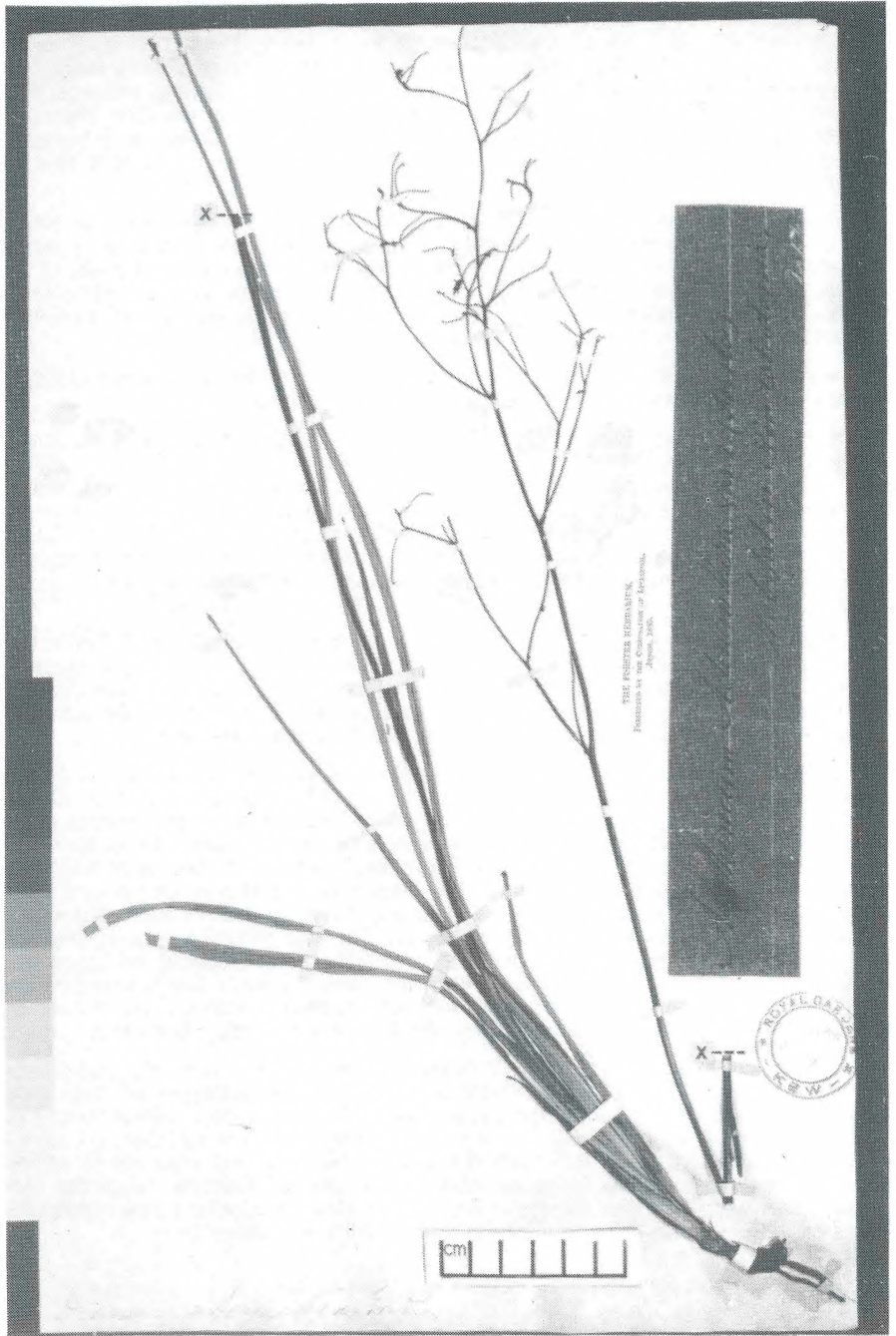


Fig. 1. Lectotype of *Anthericum adenanthera* (Forster s.n.) in K.

In his later account of New Caledonian *Dianella* taxa, Schlittler recognized eight species, none of which was *D. nemorosa* or *D. ensifolia*. Using his key to species, I believe Forster's three taxa would be identified as follows.

Taxon 1: *Dianella intermedia*

Taxon 2: *Dianella nigra* (though a specimen of this from Mare, in the Loyalty Islands, (Baumann-Bodenheim 14645) at BRI, has been determined as *D. intermedia* by Schlittler.)

Taxon 3: *Dianella javanica* (= *Rhuacophila javanica*)

Using the key to New Caledonian species of *Dianella* provided by A. Guillaumin (1940), Forster's three taxa would be identified as follows.

Taxon 1: *Dianella intermedia*

Taxon 2: *Dianella caerulea*

Taxon 3: *Dianella austro-caledonica* (= *Rhuacophila javanica*)

Since *Dianella adenanthera* applies to Forster's Taxon 1, it would appear that *D. intermedia*, whose type comes from Norfolk Island, may be a synonym of it. Consideration needs to be given to this possibility because an account of the flora of Norfolk Island is currently being prepared by Peter Green at K for the Flora of Australia project.

Typification of *Dianella intermedia* is not easy as apparently all the original material except for the protologue description, is no longer extant. The species was described in Vienna in 1833 from material collected and illustrated by Ferdinand Bauer at Anson's Bay on Norfolk Island in 1804/5. The illustrations were apparently housed with the specimens in W. Unfortunately, during World War 2, when the collections of W were divided and dispersed for safety to various localities in Austria, the portion including Bauer's materials of monocotyledons was destroyed by fire. No duplicates of this material are known so interpretation of what the name *D. intermedia* applies to depends on Endlicher's description and plants subsequently collected from the type locality.

Captain J.D. McComish investigated plants of *Dianella* on Norfolk Island and Lord Howe Island in 1938/9 and sent specimens of what he believed was *D. intermedia* Endl. from the former to K on at least two occasions. According to his notes in NSW, he also sent specimens to the National Museum of New Zealand (WELT) and the Bishop Museum in Hawaii (BISH) as well as NSW. Notes with his specimens at K read as follows:

"47. *Dianella intermedia*. Maiden, on his visit in 1902 did not see this plant. Laing, in 1912, found it at Ball Bay only, and says that it is undoubtedly rare. I find it well established at Anson Bay (where Bauer found it), also at a spot on the N.E. side of the island, and a few plants at Ball Bay. Specimens collected in Jan. at various stages from flowers to fruit. Leaves 1"[2.5 cm] wide, and up to 41"[c. 1.04 m] long. Flowers dull-cream; the divisions of the perianth darker below, with a greenish-yellow band up the centre of each; ovary roundish, greenish-yellow; style thin, white, projecting slightly beyond the anthers; stigma white, too small for me to describe; the stamens, growing from the base of the ovary, curve around it, enclosing it in a kind of cage, surmounted by the anthers; filaments white; anthers brown, with a roundish yellow base, on which they stand almost vertical. In the fully-opened flower the divisions of the perianth are turned backward, well clear of the other parts. Diameter of perianth, measured below, 3/8ths inch [0.95 cm]. Ripe fruit bluish-purple, very shiny, roundish in shape and up to 5/16ths of an inch [0.8 cm] in diameter.

I send also, specimen in fruit, collected at the end of Feb. from a plant at Ball Bay. These fruits are slightly larger than any seen at Anson Bay."

The specimens and notes give a good indication of Endlicher's plant.

There is another specimen at K which is a good guide to identifying the plant collected by Bauer on Norfolk Island. This was collected by the Quaker missionary J. Backhouse when he visited Norfolk Island in 1835. The sheet it is mounted on is labelled "*Dianella intermedia* Endl." and annotated "Probably true plant. Compared with Bauer's Drawing Nov [18]65, DO [= Daniel Oliver]".

McComish's and Backhouse's materials all agree with Endlicher's quite detailed protologue description as far as it goes. Therefore, in the absence of authentic Bauer specimens, I select McComish 47 sheet 1 at K, neotype of *Dianella intermedia*. See Fig. 2.

When comparing specimens of *D. intermedia* with ones of *D. adenanthera*, however, it is clear there are several differences between these two taxa which lead me to consider that they are distinct species. These species can be contrasted as follows.

| Taxon | <i>D. adenanthera</i> | <i>D. intermedia</i> |
|-------------------------------|-------------------------------|---|
| Rhizome | contracted | elongating |
| Shoots | adjacent | adjacent to distant |
| Inflorescence | much exceeding leaf canopy | within leaf canopy |
| Scape | erect | arcuate |
| Scape axis | ± straight | flexuous |
| Infl. Branches and Branchlets | well developed and expanded | secondary branching poorly developed, contracted distally |
| " " " | erect, divergent or spreading | arcuate to pendulous |
| Bostryces | open but contracted distally | ± contracted |
| " | 2-6-flowered | 2-12-flowered |
| Pedicels | erect or ascending | decurved to pendant |
| " | to 20 mm long | to 10 mm long |
| " | slender | ± stout |
| Flower colour | pale blue | dull cream |
| Fruit | elongated, apically pointed | spherical or subglobular |
| Ovules/locule | 2 | many (>3) |
| Seed | 3-3.5 mm long | 4-5 mm long |

Of the species in New Caledonia dealt with by Schlittler, it is possible that the taxon he called *Dianella pendula* Schlittler is correctly *Dianella intermedia* but further studies in the field in Norfolk Island and New Caledonia are required to confirm this. Such would also be required to properly place Forster's Taxon 2, which could be *D. adenanthera* too or another of the species Schlittler described from New Caledonia. Unfortunately, I am not able to say how widely outside New Caledonia *D. adenanthera* is distributed and will have to be guided in this by botanists working in neighbouring areas.

For their information, *D. adenanthera* may be described as follows.

Plant including inflorescence to c. 1 m high, tufted, solitary; rhizomes ± contracted; roots fibrous; tufts to c. 8 cm across at base. Aerial stems to c. 20 cm long, leafy throughout, ± adjacent. Leaves equitant, 5-75 cm long, arcuate, the lowest 2 to 4 reduced to scale-like sheath lacking lamina; sheath conduplicate, keeled, ± completely occluded distally; lamina 0.5-1.5 cm wide, attenuate, flat but margins becoming recurved or revolute on drying; midrib abaxially and margins scabrid or minutely toothed; nerves ± raised abaxially, not contiguous. Inflorescence erect, exceeding the foliage; panicle ± narrowly conical to ovate in outline; cymules (bostryces) open but progressively contracted distally, 2-6(rarely -9)-flowered; pedicels 3-16(-20) mm long, somewhat angularly ribbed. Perianth segments narrowly elliptic, pale blue or greenish blue; sepals 5-6 mm long, 5-nerved; petals 4.2-5.5 mm long, 3-nerved. Stamen filament-swelling 0.4-0.6 mm long, 0.4-0.5 mm wide, yellow; anthers 2.8-3 mm long, red-brown. Ovules 2 per locule. Berry obloid to ovoid or irregular when dried, 4-7 mm long, apically pointed, purplish black when ripe. Seed oblong to obliquely obovate in outline, biconvex in transverse section,

3–3.5 mm long × 2–2.5 mm wide; testa smooth or slightly irregularly marked with shallow depressions, black, very shiny.

Specimens seen: New Caledonia. Montravel Botanical Gardens, Jan 1976, *Seawright* (BRI); Baie Tina, Noumea, Jul 1978, *Henderson* H2627 (BRI); Ile Yande, Aug 1978, *Veillon* 3659 (BRI,NOU); Ile Art, Aug 1978, *Veillon* 3695 (BRI,NOU).

The relationship of *D. adenanthera* to *D. nigra* Colenso from New Zealand, with which it has many attributes in common (cf. Moore & Edgar 1970), also needs to be considered. The chief distinctions between these two seem to be the latter's darkly coloured, more compound, more slender inflorescence axes, more slender pedicels ± slightly curving and up to 40 mm long, and fruit that is ± globose or oblong but not pointed (cf. Schlittler 1940, t. XXI).

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